

# ARCH 2431. Building Technology III

## Building Information Modeling with Revit

### *Steel Connections* *#4 Concrete Footing to Base Plate*



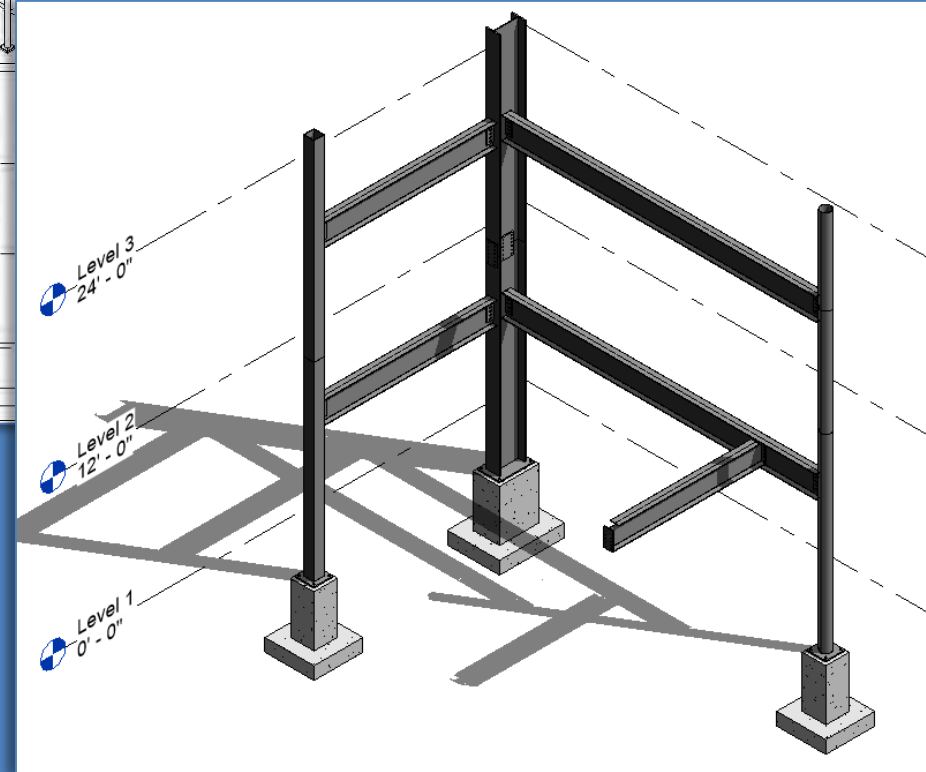
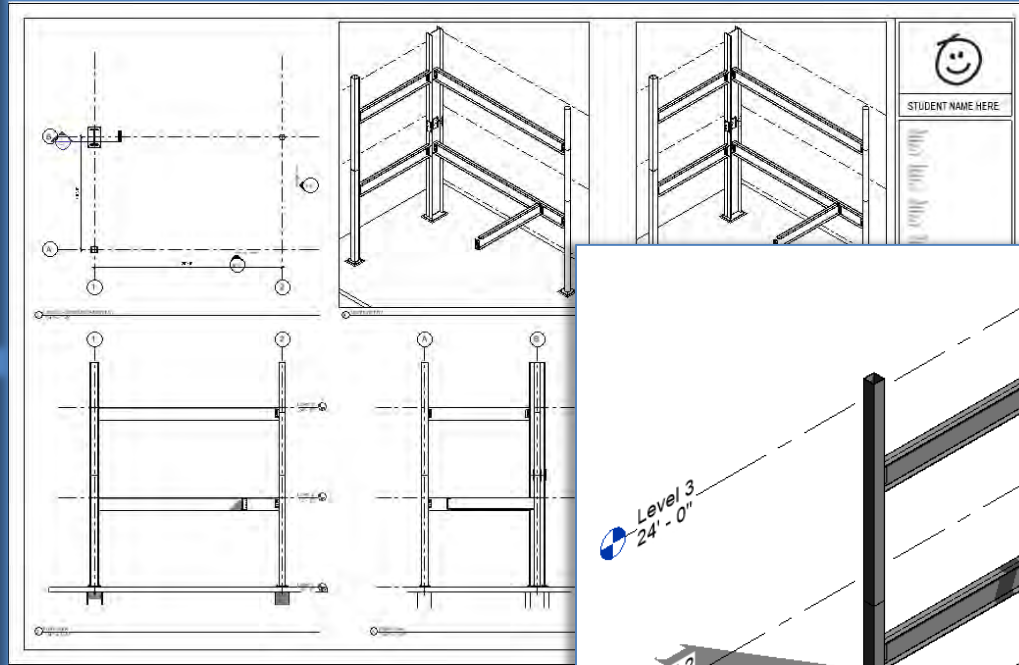
Professor Paul C. King, RA, AIA, ARA

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[Pking@CityTech.Cuny.Edu](mailto:Pking@CityTech.Cuny.Edu)

# Steel Connection Detail Development

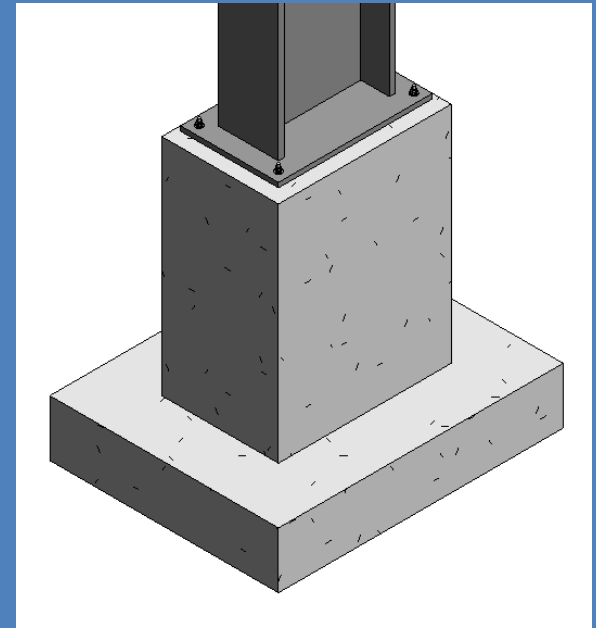
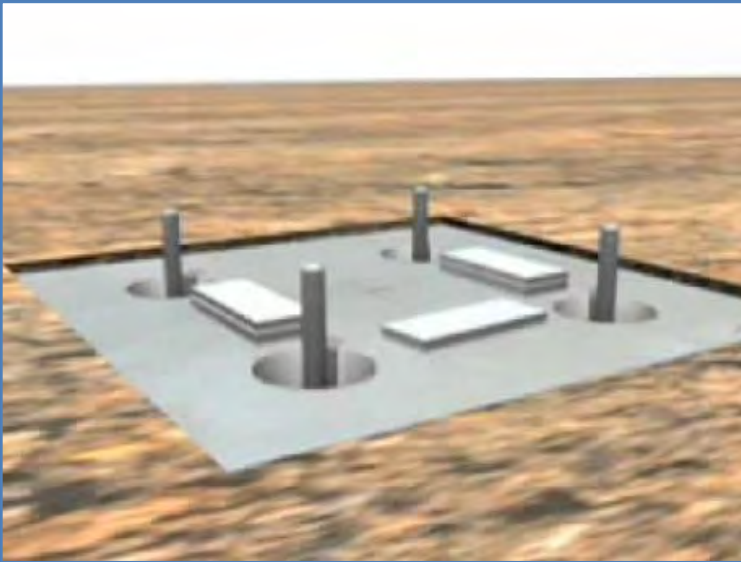
- 22 X 34 Sheet
- Coordinated Views & Isometrics



- *Base Plate & Footing*
- *Fin Plate Connection*
- *Splice Plate Connection*
- *Notched Beam with Bolting Plate*

# Concrete Footing to Baseplate Connection

*Column Base Plate to Foundation*



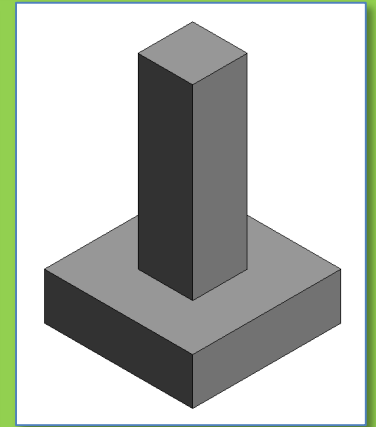
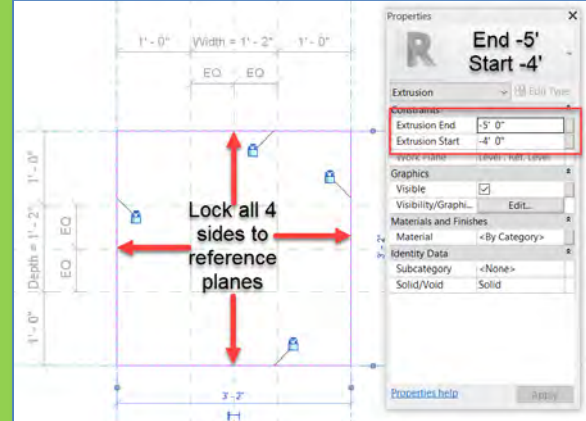
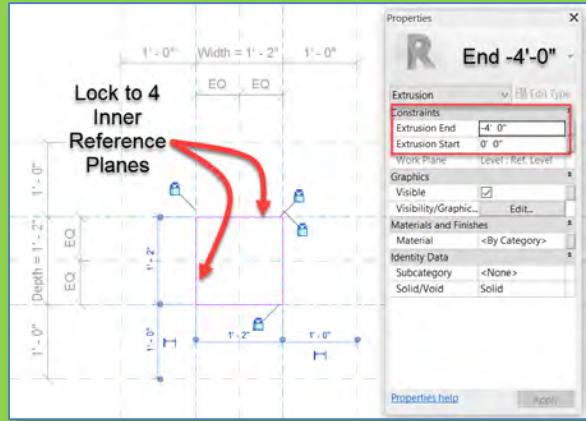
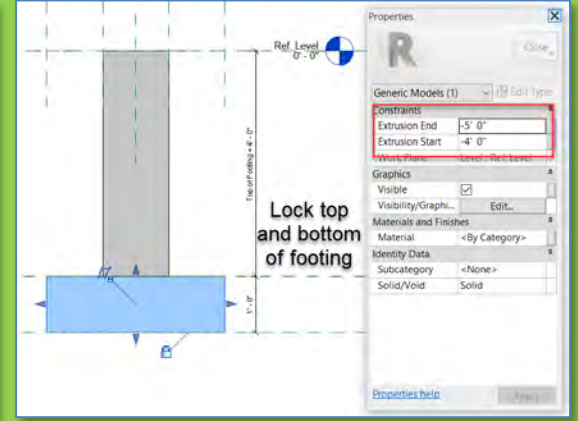
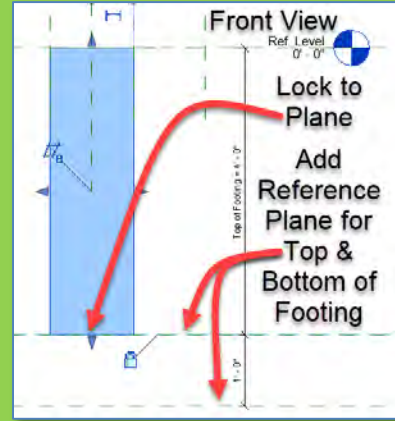
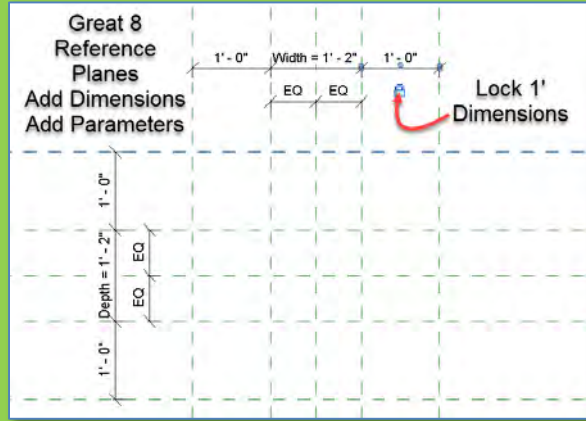
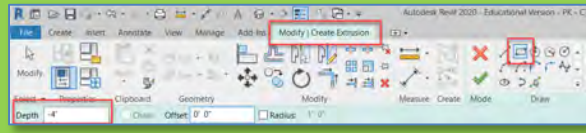
# Concrete Isolated Footing with Hold Down Bolts

## Connection Details

- Connections
- Videos
- Concrete Footing
- Cone Shaped Void
- Threaded Rod
- Nut & Washers
- Assemble
- Load into Project

- Add Slab
- Develop Details

- Create 8 reference Planes, Add Dimensions & Parameters
- Create > Extrusion (center of footing -4'-0" depth)
- Create > Extrusion (base of footing Start -4', End -5')

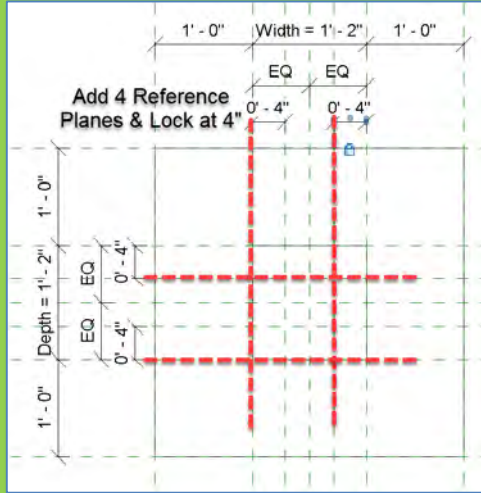


# Concrete Isolated Footing with Hold Down Bolts

Connection Details

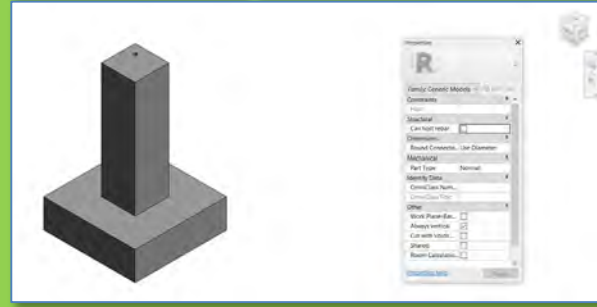
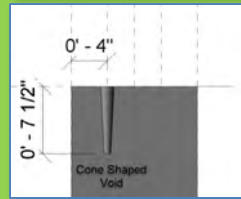
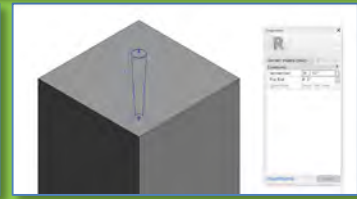
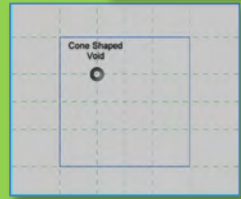
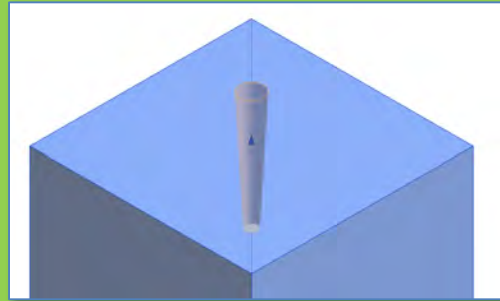
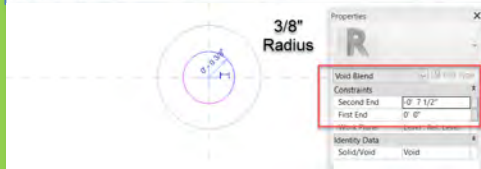
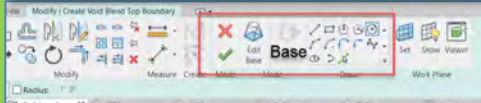
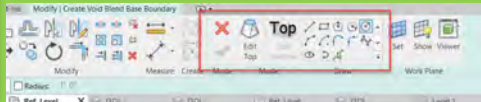
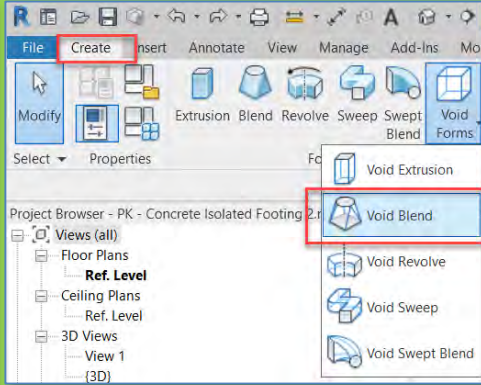
- Connections
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- Cone Shaped Void
- Threaded Rod
- Nut & Washers
- Assemble
- Load into Project

- Add Slab
- Develop Details



Create Cone Shaped Void

- Create 4 Reference Planes & Lock at 4"
- Create > Void Blend
  - Top 3/4" Radius
  - Base 3/8" Radius
  - First End 0'-0"
  - Second End -7 1/2"

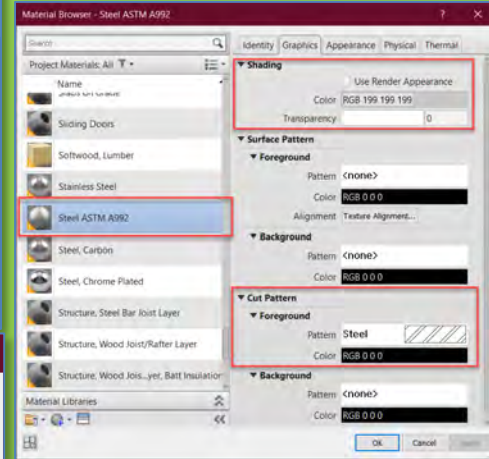
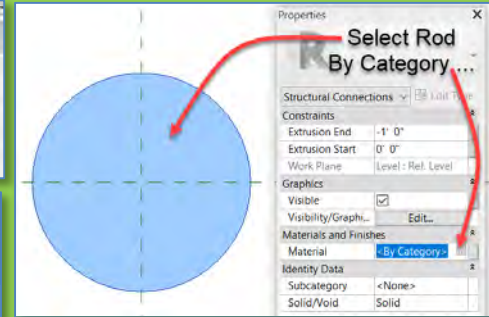
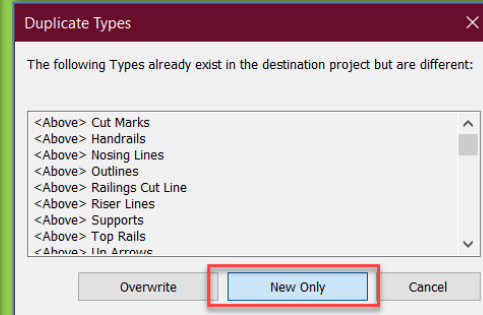
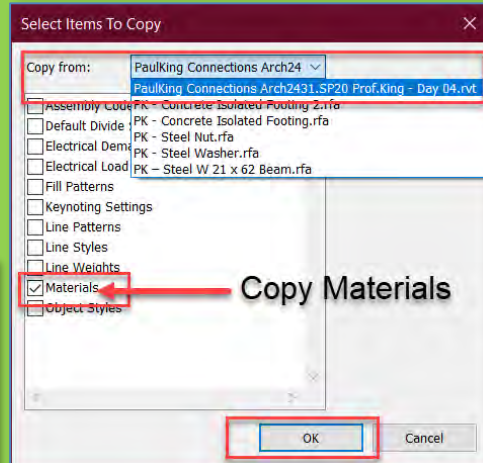
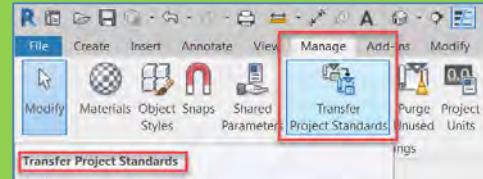
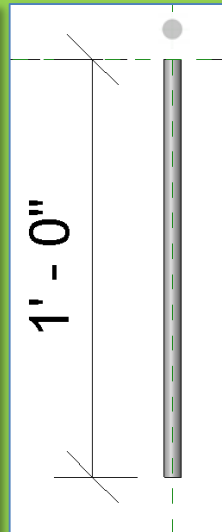
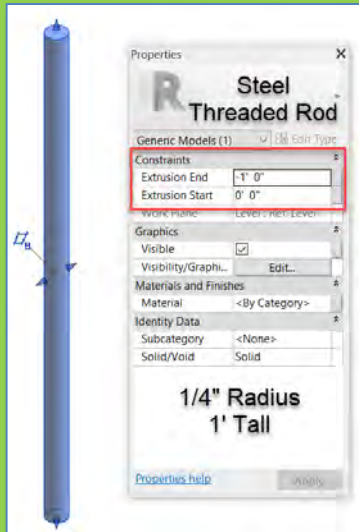


# Create Threaded Rod, Nut and Washers - Import

## Connection Details

- Connections
  - Videos
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- *Create > Extrusion (1' rod)*
- *Transfer Project Standards*
- *(Copy from your project file)*
- *Import Materials Library*
- *Select "Rod" and set Material Category*
- *Steel ASTM A992*



- *For all families get in the habit of assigning materials so they render and detail correctly*

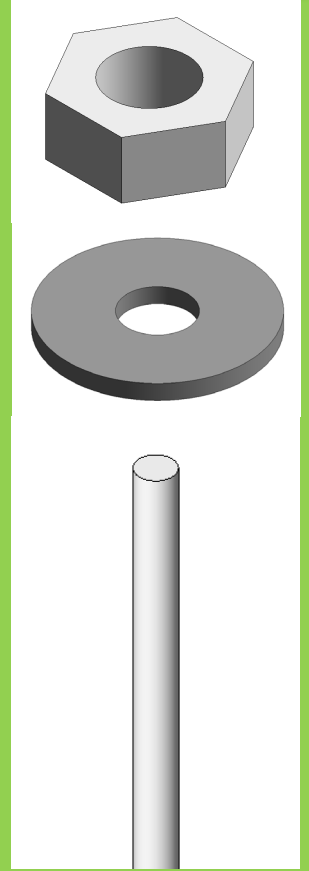
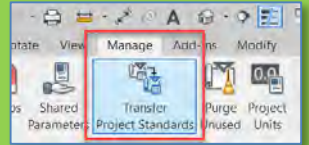
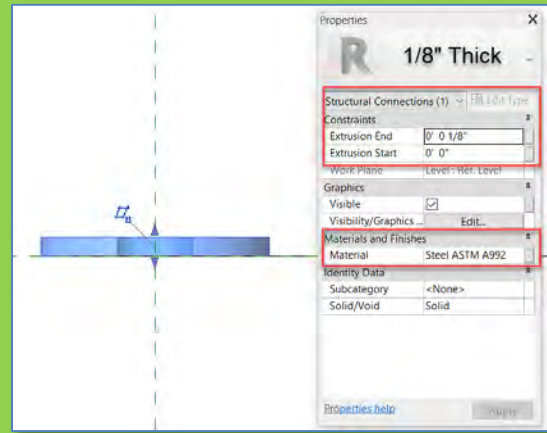
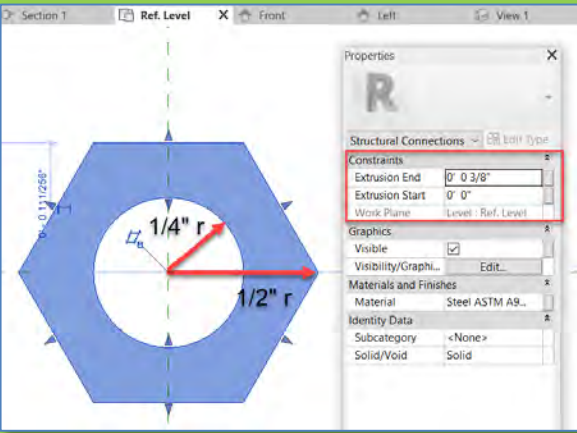
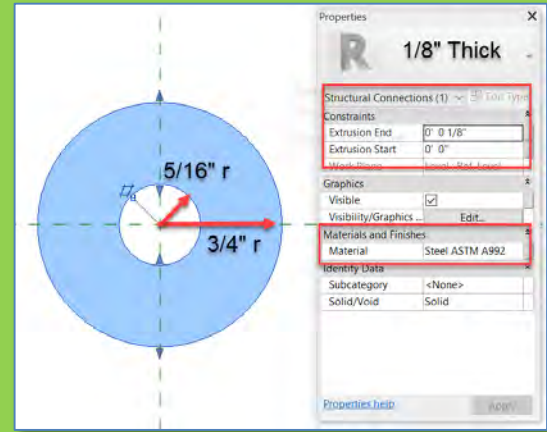
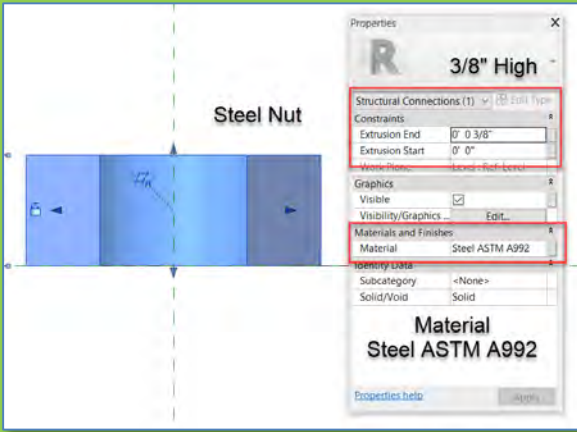
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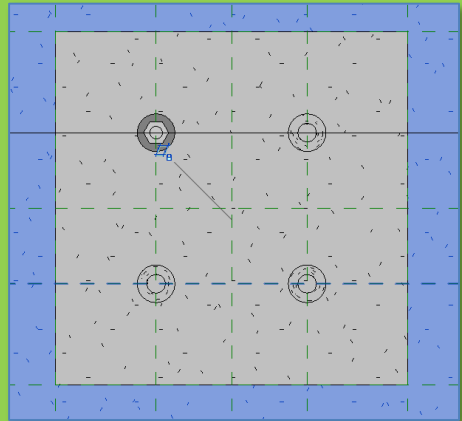
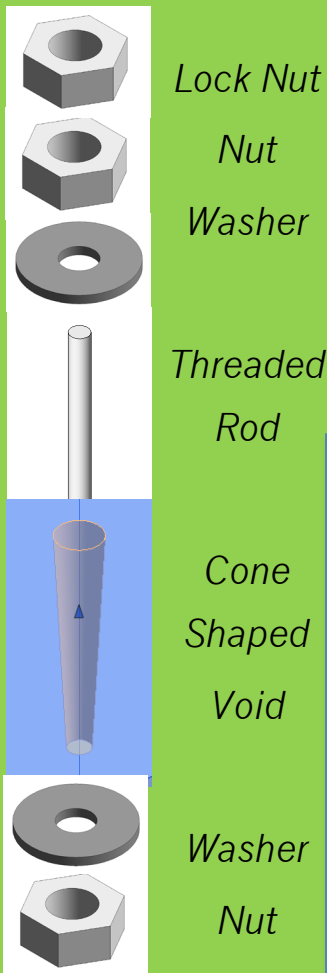
- Add Slab
- Develop Details

- *Steel Nut*
- $\frac{1}{2}$ " radius with  $\frac{1}{4}$ " radius hole x  $\frac{3}{8}$ " high
- *Steel Washer*
- $\frac{3}{4}$ " radius with  $\frac{5}{16}$ " radius hole x  $\frac{1}{8}$ " high

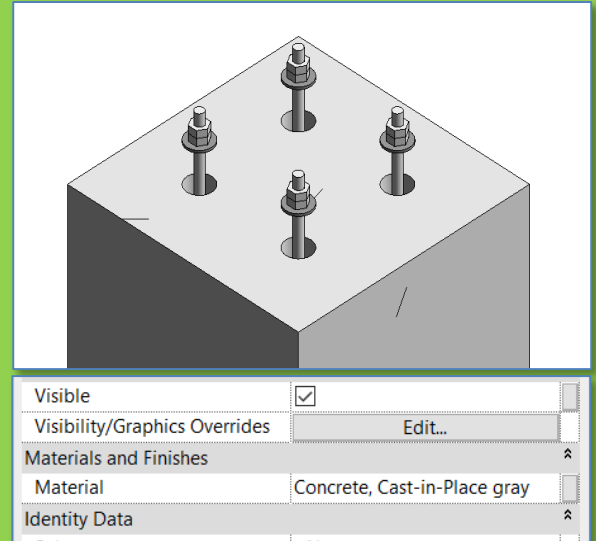
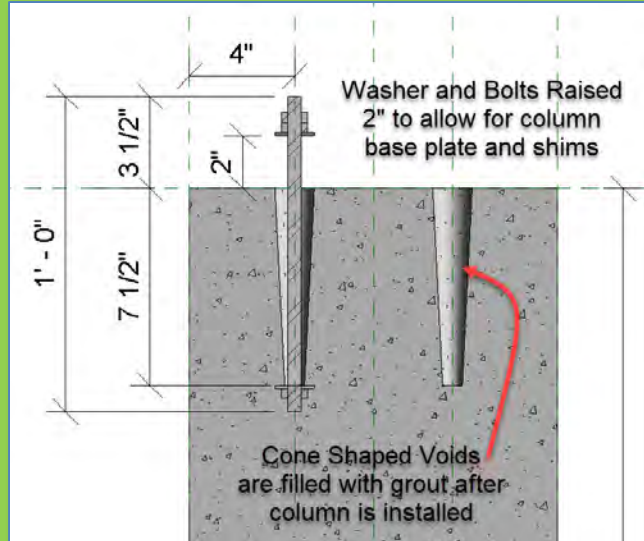


# Assemble Components in Concrete Footing Family

- Load the Threaded Rod, Nut & Washer into the Concrete Footing Family



- Locate each component and make certain each is locked to the correct reference planes
- Set the material for the footing to concrete, cast-in-place
- Load the Footing Family into the project file.
- All sub families will load as well

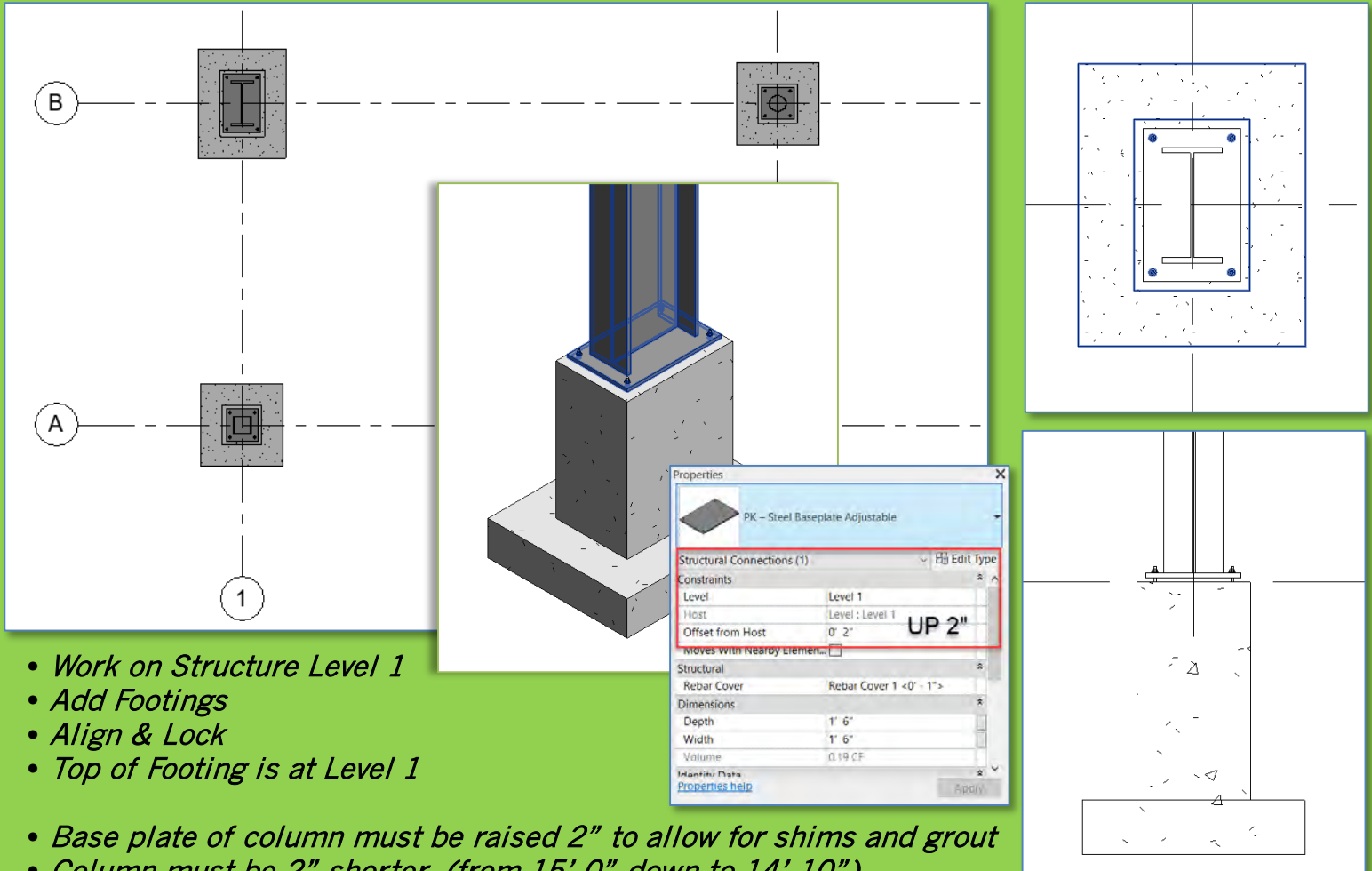




# Align and Lock the Concrete Footing to the Columns

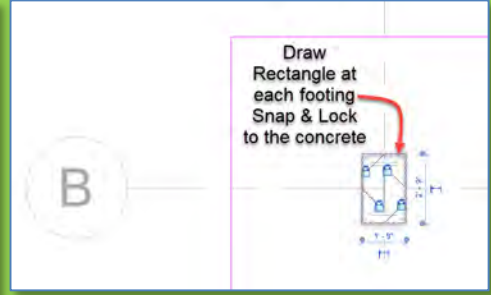
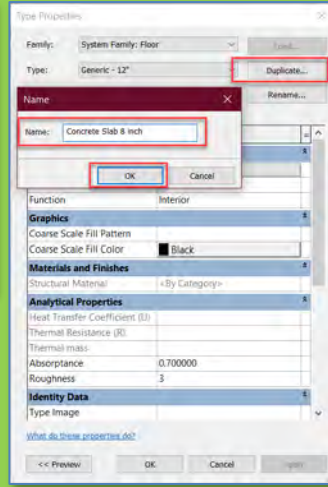
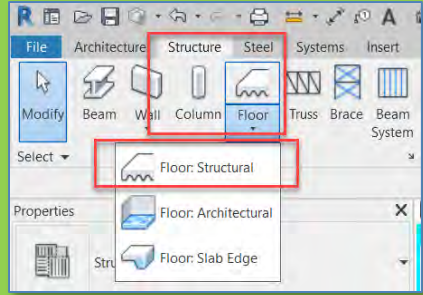
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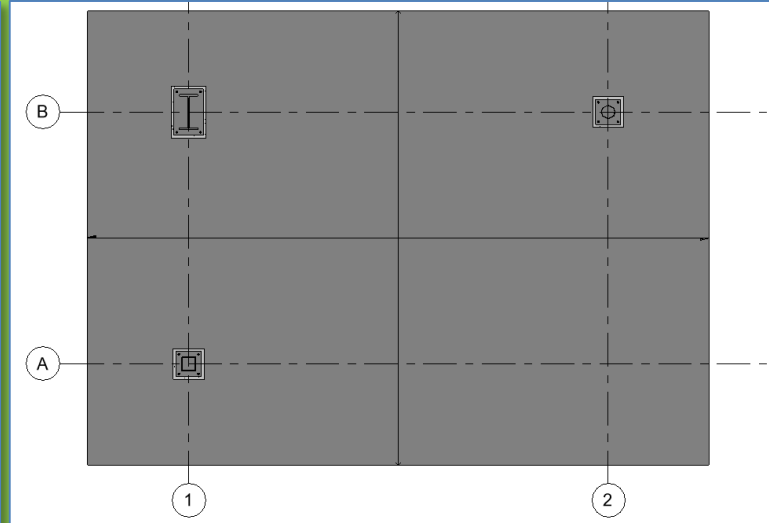
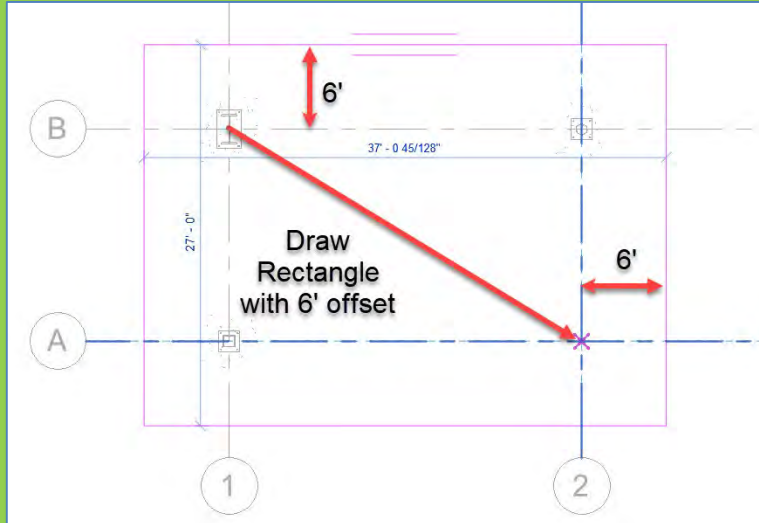
# Draw a concrete floor slab on Level 1 Structural

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- Create a Structural Floor
- Select Generic 12"
- Duplicate > Concrete Slab 8 inch
- Structure > Thickness = 8"
- Material = Concrete

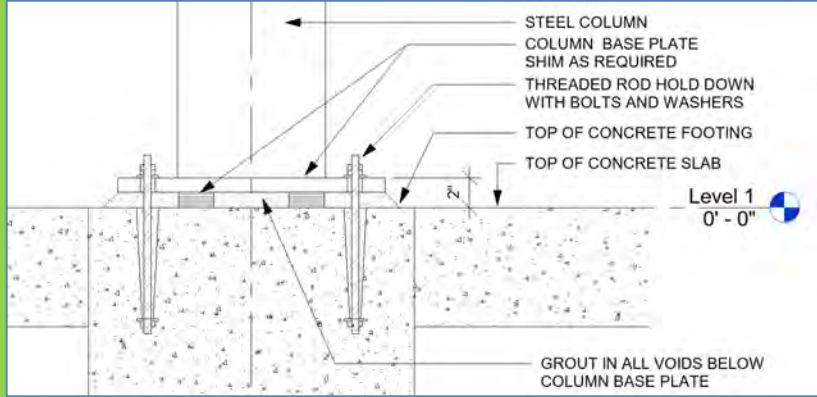
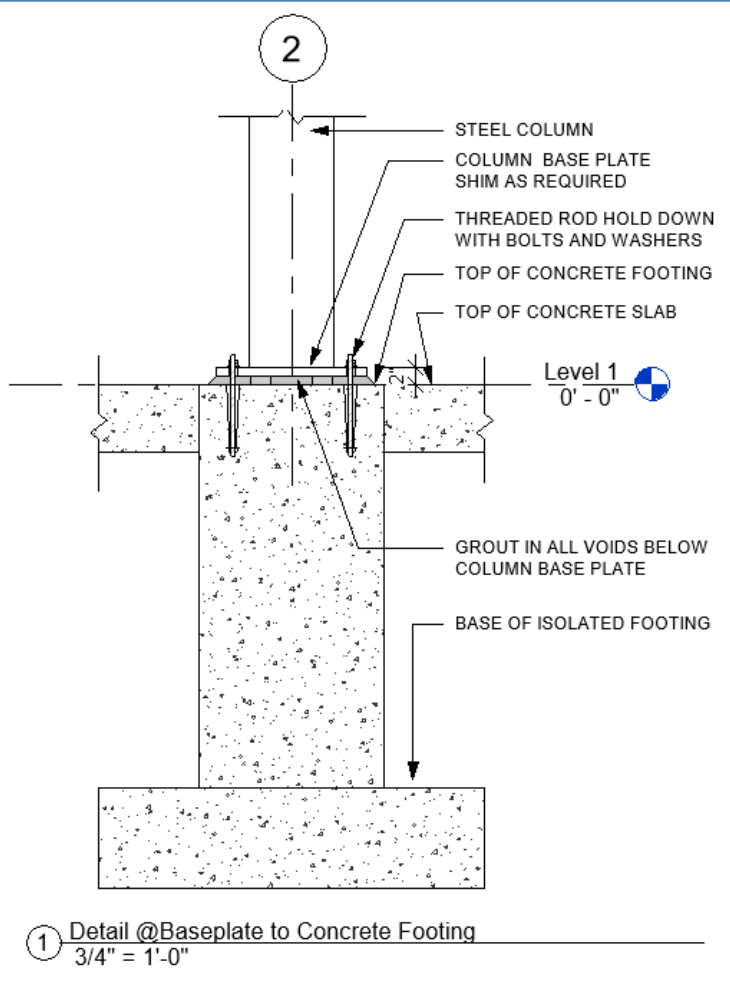
- Draw Rectangle with 6' offset from grid intersection to grid intersection
- (use space to flip offset direction)
- Add Rectangle at each footing – snap & lock to the concrete – not the steel



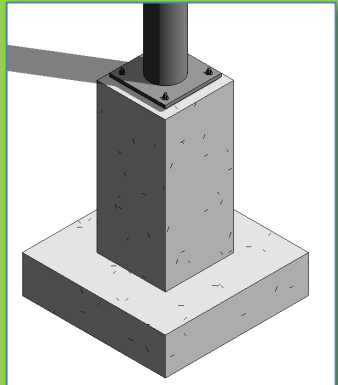
# Modify Base Plate Elevations as needed – add details

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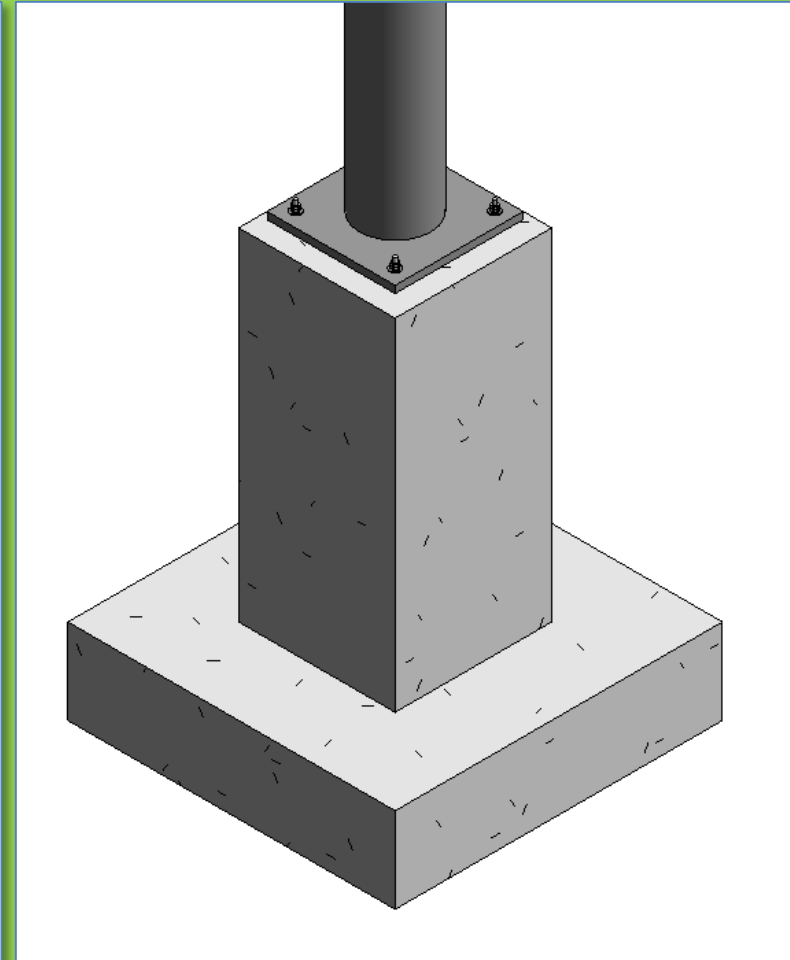
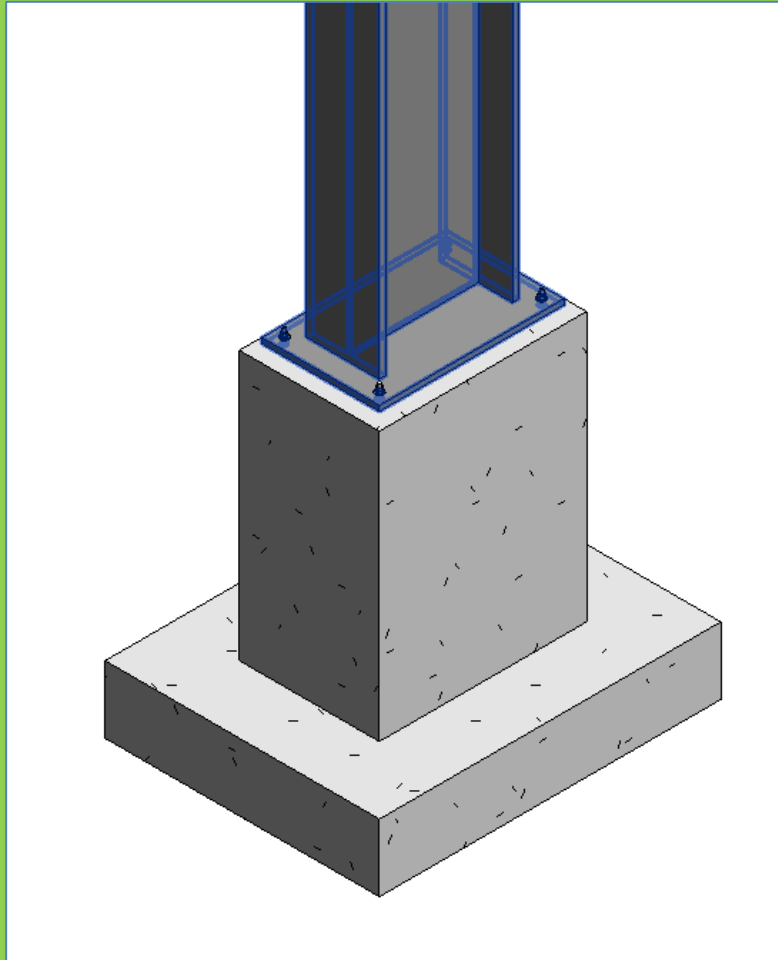
- *Develop a detail of the footing condition*
- *Top of Footing can also be recessed to allow for finish flooring to cover*



# Isometric Views of the Project File

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